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(71) Applicant: **FCL HOLDING NV**  
**3550 Heusden-Zolder (BE)**

(72) Inventor: **CLYMANS, Bart**  
**3582 KOERSEL (BE)**

(74) Representative: **Gevers Patents**  
**Intellectual Property House**  
**Holidaystraat 5**  
**1831 Diegem (BE)**

(54) **CHARGING ELECTRIC VEHICLE BATTERIES WITH EXTERNAL CONVERTERS USING THE TIMESHARING PRINCIPLE**

(57) The object of the invention is to charge the battery of multiple electric vehicles (cars, buses, trucks), which are simultaneously connected to multiple charging stations during parking, but are sequentially charged by 1 common DC charger. The number of electric vehicles charged by 1 DC charger in timesharing is of the order of magnitude 8 to 32. The aim is to spread the investment cost of the DC charger over multiple charging points so that it is price competitive with AC chargers as a parking charger, but retains the advantage of fast charging if required. Optionally, in V2G mode, the DC charger can use the combined battery capacity of all attached electric vehicles.

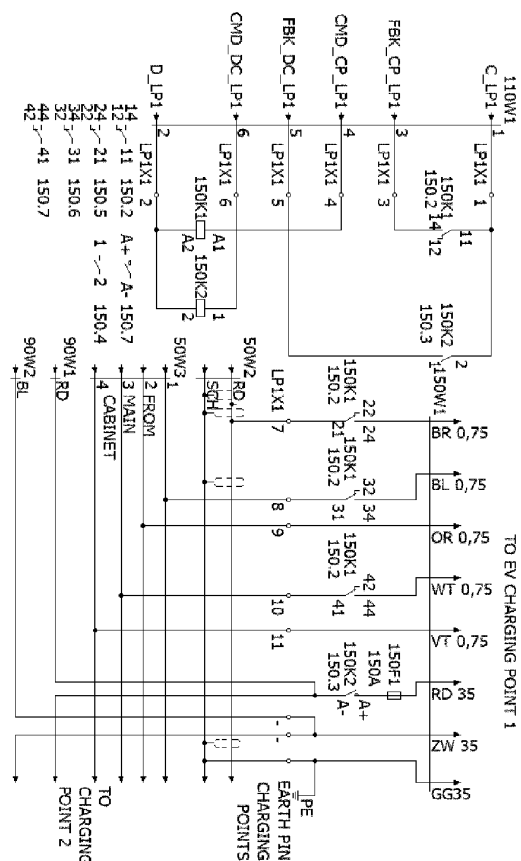


Fig. 5

(52) Cooperative Patent Classification (CPC): (Cont.)  
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## EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 8 643 330 B2 (NERGAARD TROY ADAM [US]; SUKUP MARTIN [US] ET AL.) 4 February 2014 (2014-02-04) * column 4, line 44 - column 7, line 24; figures 1-10 *	1-7	INV. B60L53/65 B60L53/66 B60L53/67
X	US 11 285 831 B1 (YOUSSEFZADEH EMIL [US] ET AL) 29 March 2022 (2022-03-29) * column 4, line 32 - column 5, line 43; figures 1,2 *	1-7	
X	EP 2 305 510 B1 (SCHNEIDER ELECTRIC USA INC [US]) 6 April 2022 (2022-04-06) * the whole document *	1-7	
A	WO 2019/153305 A1 (ABB SCHWEIZ AG [CH]; HUANG XING [CN]; XIE HAILIAN [CN]; GE JUNJIE [CN]) 15 August 2019 (2019-08-15) * paragraph [0043] - paragraph [0048]; figure 1 *	1-9	
A	US 2013/314037 A1 (CAFFY JAMES B [US]) 28 November 2013 (2013-11-28) * paragraph [0021] - paragraph [0057]; figures 1-7 *	1-9	TECHNICAL FIELDS SEARCHED (IPC) B60L
A	DE 10 2011 083065 A1 (SIEMENS AG [DE]) 21 March 2013 (2013-03-21) * paragraph [0026] - paragraph [0038]; figures 1,2 *	1-9	
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>19 January 2024</b>	Examiner <b>Degraeve, Alexis</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

# ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 23 17 2304

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
<b>US 8643330 B2</b>	<b>04-02-2014</b>	<b>CN 103828181 A</b>	<b>28-05-2014</b>
		<b>CN 107026487 A</b>	<b>08-08-2017</b>
		<b>EP 2751902 A1</b>	<b>09-07-2014</b>
		<b>JP 2014527393 A</b>	<b>09-10-2014</b>
		<b>US 2013057209 A1</b>	<b>07-03-2013</b>
		<b>US 2013057210 A1</b>	<b>07-03-2013</b>
		<b>WO 2013032519 A1</b>	<b>07-03-2013</b>
<hr/>			
<b>US 11285831 B1</b>	<b>29-03-2022</b>	<b>US 11285831 B1</b>	<b>29-03-2022</b>
		<b>US 2022363155 A1</b>	<b>17-11-2022</b>
<hr/>			
<b>EP 2305510 B1</b>	<b>06-04-2022</b>	<b>EP 2305510 A2</b>	<b>06-04-2011</b>
		<b>US 2011074350 A1</b>	<b>31-03-2011</b>
<hr/>			
<b>WO 2019153305 A1</b>	<b>15-08-2019</b>	<b>NONE</b>	
<hr/>			
<b>US 2013314037 A1</b>	<b>28-11-2013</b>	<b>NONE</b>	
<hr/>			
<b>DE 102011083065 A1</b>	<b>21-03-2013</b>	<b>NONE</b>	
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